REMARKS

This application has been carefully reviewed in light of the Office Action dated April 5, 2004 (Paper No. 13). Claims 1 to 5, 7 to 12, and 14 to 18 are in the application, of which Claims 1, 8 and 15 are still the only independent claims. Reconsideration and further examination are respectfully requested.

Claims 1 to 5, 7 to 12 and 14 to 19 were rejected under 35 U.S.C. § 103(a) over U.S. Patent 5,905,820 (Cushman) in view of U.S. Patent 6,134,338 (Solberg)[1/]. Reconsideration and withdrawal of the rejections are respectfully requested.

The invention concerns optical character recognition in which OCR processing proceeds based on an OCR parameter. According to one feature of the invention, an optimal OCR parameter is identified by executing OCR processing on a reduced-resolution version of the original image, and actual OCR processing is thereafter performed on the original image so as to acquire a character code corresponding to the character image.

Thus, as set out in the claims herein, a reduced-resolution version of a character image represented at a first resolution is created, wherein the reduced-resolution of the image is represented at a second resolution lower than the first resolution. An optimal OCR parameter for OCR processing is identified, and it is identified by executing

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[1/]Page 3 of the Office Action provides an incorrect listing of the rejected claims. Pages 4 through 8, however, are reasonably clear on the Examiner's disposition on each of the claims, and it is believed that the rejection set out above was intended. If was not, clarification is respectfully requested.

OCR processing of the reduced-resolution version of the character image represented at the second resolution. The character image represented at the first resolution is OCR-processed with the optimal OCR parameter, so as to acquire a character code corresponding to the character image.

Thus, character recognition according to the present invention proceeds in two stages: a first stage in which an optimal OCR parameter is identified by executing OCR processing on a reduced-resolution version of an original character image, and a second stage in which OCR processing with the optimal OCR parameter is performed on the original character image, so as to acquire a character code corresponding to the character image. By virtue of this two-stage process, an optimal OCR parameter can be identified quickly (since it is identified by executing OCR processing on a reduced-resolution version of the character image) and then applied to the original character image.

Cushman, on the other hand, is unrelated to machine-based OCR processing, but rather is directed to image pre-processing which sharpens an image and otherwise makes it more suitable for viewing by a human viewer. It is clear that the Office Action disagrees with this assertion, and rather has interpreted Cushman as describing machine-based OCR processing. But whichever interpretation of Cushman is correct (and Applicant continues to believe that his interpretation is correct and not that of the Office Action), it is clear that Cushman does not describe a two-stage character recognition processing in which an optimal OCR parameter is identified by executing OCR processing on a reduced-resolution of an original character image, followed by OCR processing of the

original character image with the optimal OCR processing so as to acquire a character code corresponding to the character image.

Rather, as understood by Applicant, Cushman discloses an downsampling of an image in step 30, and conversion of the down-sampled image into a grey-scale image with two-bit data by using thresholding values obtained in step 34. The purpose of these steps is to display an image to a human viewer (see step 48), but not to obtain an optimal OCR parameter and not to apply the OCR parameter so-obtained for processing of a character image at a first resolution.

Solberg has been reviewed, and it is true that Solberg is directed to use of OCR software. However, the OCR process of Solberg is totally different from that of the present invention and that described above.

In maintaining the rejection over Cushman, the Office Action relies in part on lines 10 to 14 of Cushman's column 5, which as part of its thresholding description incorporates the teachings from U.S. Patent 5,050,222 (Lee). It is true that Lee mentions a graphics/text separation method, whereby segmented character contours are ready for OCR processing and for conversion into ASCII characters. Nevertheless, Lee's teachings are incorporated only into Cushman's thresholding step. Accordingly, the fact remains that Cushman is unrelated to machine-based OCR processing.

The Office Action also cites to Figures 9 and 10 of Cushman, and asserts that the threshold sets shown there correspond to an OCR parameter for OCR processing. As Applicant sees it, this correspondence is factually incorrect, for the reason that Cushman's threshold sets are never utilized in OCR processing. In addition, the claims

specify that an optimal OCR parameter is applied in OCR processing of an image at a higher resolution, and is derived by executing an OCR process on an image at a lower resolution. For its part, however, Cushman's threshold sets are both derived from and applied to a low resolution image.

It is therefore respectfully submitted that the claims herein define an invention that would not have been obvious from the applied art. The applied art does not describe a two-stage OCR process in which (a) an optimal OCR parameter is identified by executing OCR processing on a reduced resolution version of a character image, and (b) the original character image (at a higher resolution) is OCR-processed with the optimal OCR parameter so as to acquire a character code corresponding to the character image. Allowance of the claims is therefore respectfully requested.

Applicant's undersigned attorney may be reached in our Costa Mesa, California office at (714) 540-8700. All correspondence should continue to be directed to our below-listed address.

Respectfully submitted,

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